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Nomophobia and its impact on mindfulness and self-efficacy among nurses: An analytical cross-sectional study in the institution of national importance, Western India

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Abstract:

BACKGROUND: The interaction between people and advanced information and communication technologies results in behavioral addictions, one of them is nomophobia. In a health care setting, nurses constitute a significant proportion of healthcare workers. Therefore, discovering the level of nomophobia and its impact on constructs such as mindfulness and self-efficacy is very important as this might affect the psychological and physical well-being of nurses, which can impact the quality of patient care. The study aimed to assess the level of nomophobia and its relationship with mindfulness and self-efficacy of nurses.

METHODS AND MATERIAL: An analytical cross-sectional study was carried out in a tertiary care hospital. A total of 420 nurses were selected using a convenience sampling technique. Self-structured questionnaire was used to assess socio-demographic characteristics and mobile phone use. Standardized questionnaires were administered in pen and paper format for measuring nomophobia, mindfulness, and self-efficacy. Statistical Package for Social Sciences (SPSS) version 20.0 was used. Karl Pearson's correlation coefficient and Chi-square test were employed to analyze the data.

RESULTS: The majority of nurses (99.5%) had nomophobia. About half of them (53.3%) had a moderate level of nomophobia. Nearly half of nurses had high level of mindfulness (52.6%) and self-efficacy (53.3%) respectively. Further, nomophobia was found to be negatively correlated with mindfulness (r = -0.289) and self-efficacy (r = -0.278).

CONCLUSION: Nomophobia poses a risk to the mindfulness and self-efficacy of nurses. Continuing education should focus on awareness programs emphasizing good practices in the use of current technologies.

Keywords:

Mindfulness, nomophobia, nurses, self-efficacy, smartphone

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Introduction

A health care organization aims to deliver at par health care facilities to society. According to the National Health Workforce Account (NHWA) 2018, there is a total stock of 5.76 million health workers in India. Among this, 2.34 million are nurses and midwives, which suggests that nurses constitute a significant proportion of health care workers.[1] Therefore, the aim of provision of at par health care facilities can be achieved if this section of health care workers is competent enough and in the full state of psychological and physical well-being.

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In recent years, advancements in information and communication technology have grown in leaps and bounds which converted the concept of normative lifestyle to technology-oriented and digital co-dependent prospects.[2] Worldwide smartphone users are estimated to reach 7.7 million by 2027. The number of smartphone users has reached over one billion in 2023 in India and it is estimated that the number will reach 1.55 billion in 2040.[3] Talking about the health care setting, smartphone use has influenced the overall practice of medical professionals.[4] This digital co-dependent lifestyle has some serious consequences. One of them is nomophobia, a modern-day construct that has arisen due to the global and pervasive use of information and communication technology especially smartphones.[5,6]

Nomophobia has been born out of the conjunction of two words- "no mobile phone" and "phobia", that is fear, discomfort, and anxiety that arises when one is not able to access a smartphone and its facilities or connect with virtual communication providing platforms.[7] Individuals possessing this construct show features such as checking the phone constantly, sleeping with the phone, and keeping the phone ready and available for communication or for accessing any information.[8] It has been linked with decreased face-to-face relationships which further leads to loneliness, decreased self-esteem, and happiness.[9,10]

Although, nurses use a smartphone at the workplace to get access to clinical information and to communicate with other health care team members, it can also act as a constant source of distraction, poses a risk to patient privacy, and also a source of health care-associated infections.[4,11] Acts like putting off important tasks and distractions have been linked with the use of smartphones at the workplace.[12] The distraction leads to decreased attention and decreased ability to remember the important task.[13] The constant distraction and features associated with nomophobia may have a tendency to influence psychological constructs like mindfulness and self-efficacy which are essential for competent nursing practice and also for the complete well-being of nurses.

Studies suggest that mindfulness that is non-judgemental and receptive attending of ongoing events is linked to more job satisfaction, lesser emotional exhaustion, lesser cognitive failures, and the time for which an individual can follow a practice.[14,15] In the same line, general self-efficacy which is one's judgment of his/her ability to execute a course of action decides how people think and motivate themselves.[16,17] People with a high level of self-efficacy tend to choose more challenging and moderately difficult goals along with this, they show more consistent efforts toward their goals.[18] A nursing professional must have a blend of clinical decision-making skills, interpersonal relationship building skills, and competency in the provision of nursing care.[19] These skills can be enriched with the presence of mindfulness and self-efficacy. In the nursing population, most of the studies of nomophobia have been done on nursing students. But considering the widespread use of smartphones, nomophobia can affect various population groups, however, the thrust of research is more on adolescents and young adults.[20] There is a paucity of research evidence of nomophobia among one of the pillars of the health care system that is, "nurses". The studies on the relationship between individuals and nomophobia are important because behavioral changes, as well as symptoms and feelings produced by a new technology, must be studied and monitored closely and continuously. Therefore, this study aimed to assess the level of nomophobia and its relationship with mindfulness and self-efficacy among nurses. It was hypothesized that there was no relationship of nomophobia with mindfulness and self-efficacy at a level of 0.05 significance.

Materials and Methods

Study design and setting

An analytical cross-sectional design was used to conduct the study at a tertiary health care institution. STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines were used in writing the manuscript.

Study participants and sampling

The target population for the current study was nurses. The sample size for the study was determined using Cochran formula, considering the 50% prevalence of nomophobia due to the absence of earlier studies on nomophobia among nurses in India.[21] A non-response rate of 10% was taken into consideration. Before the main study, a pilot study was conducted on 10% of the total sample in the month of September 2021, in which a total of 40 participants were included. Hospital areas included in the pilot study were later excluded from the main study. In the main study, 420 nurses were included. Nurses having at least one mobile phone and those using a mobile phone for at least one year were included in the study. Whereas, nurses diagnosed with psychiatric and neurological illnesses were excluded from the study. Nurses recruited at various areas of the hospital (Inpatient areas, Outpatient areas, Operation Theatres, Emergency areas, and Intensive Care Units) were selected as study participants using a non-probability convenience sampling technique [Figure 1].

Data collection tools and techniques

Data collection was done in pen and paper format using one self-structured questionnaire (Socio-demographic

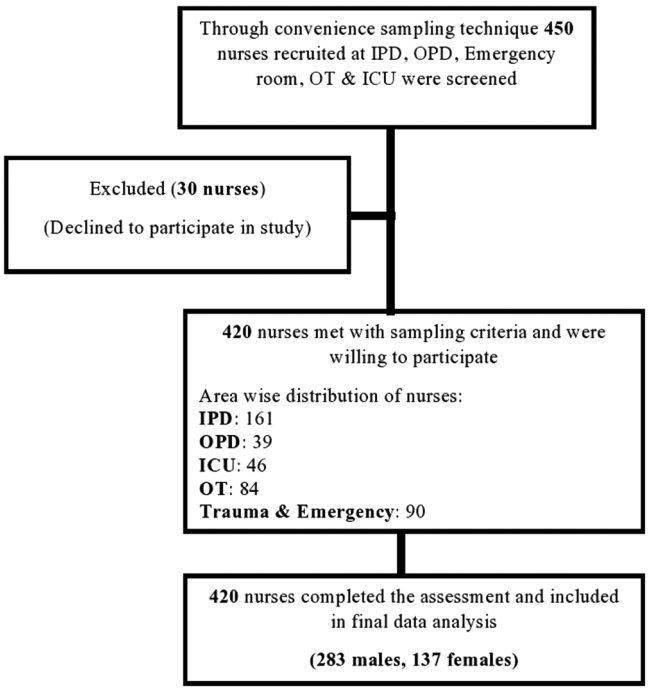

Figure 1: Total 450 nurses were assessed for eligibility, all met with eligibility criteria but 30 nurses were not willing to participate, therefore 420 nurses completed the assessment among which 283 were male and 137 were females. All of them were included in final data analysis

Data Sheet and Information Related to Smartphone Use) and three standardized questionnaires. A self-structured questionnaire was generated from literature and expert contribution and further validated by five experts. The reliability of the standardized tools was not checked in the present study. A questionnaire (NMP-Q) that was developed and validated by Yildrim and Correia was used to assess the independent variable (predictor) that is, nomophobia. It is a self-report, 7 points Likert scale consisting of 20 items with Cronbach's alpha for internal consistency of 0.945, which shows good reliability. The scale consists of four dimensions.[7] Mindfulness Attention Awareness Scale (MAAS) developed by Krick Warren Brown was used to assess the level of mindfulness. It is a 15 item, 6 points Likert scale. This scale has Cronbach's alpha for internal consistency of 0.82 and test-retest reliability of 0.70. For scoring this scale, the mean of scores of 15 items was computed, higher scores reflected a higher level of mindfulness.[14] Another standardized questionnaire used was the General Self-efficacy scale (GSE), developed by Matthias Jerusalem and Ralf Schwarzer. It consists of 10 items, four points Likert scale, ranging from 1 = not at all true to 4 = exactly true. This scale has Cronbach's alpha for internal consistency of 0.90. Scoring is done by calculating the sum of all items. Since the mean is a more rigid and stable central tendency, the mean score was considered as cut-off point. Participants having higher scores were considered to have a high level of self-efficacy.[16] All these tools were employed in the study after taking permission from the concerned authors of each tool. Data collection was done in the month of October and November 2021. During the main study data collection, nurses appointed at different areas of the hospital were approached individually by the researchers themselves. Information related to the study was provided to each participant by the researcher. Around 450 nurses were approached, among them 420 met the sampling criteria. Everyday data collection was done from approximately seven participants. The detail of the recruitment of nurses in the study is mentioned in Figure 1.

Statistical analysis

IBM SPSS for Windows Version 20.0 was used to analyze the data. Prior to this data were tabulated and coded in MS Excel 2016. Data screening was carried out prior to analysis. Cases were assessed for missing data. As each participant was approached individually and before collecting back the questionnaire from participants, its completeness was ensured by the researcher. Therefore, no data was found to be missing. As a result of which, data from a total of 420 nurses were included in the final analysis. Tests for data normality were not done.

Measures of central tendency and measures of dispersion were used to describe continuous data whereas frequency and percentages were employed to describe categorical variables. Karl Pearson's correlation coefficient was used to ascertain the correlation of nomophobia with mindfulness and self-efficacy of nurses. Chi-square test was employed to determine the association of nomophobia, mindfulness, and self-efficacy with socio-demographic variables and variables related to smartphone use.

Ethical consideration

Before the beginning of the study, ethical permission was obtained from the Institutional Ethics Committee. Informed consent was taken from participants initially. Along with this confidentiality and anonymity of participants were ensured throughout the study.

Results

Socio-demographic Characteristics and Information Related to Smartphone Use.

Socio-demographic data were obtained from 420 nurses. The majority (63.3%) of nurses were from the 27-32 years of age group, with most being male (66.9%). 78.8% of nurses graduated, whereas only 8.1% of nurses were post graduated. Nearly half (48.3%) of the nursing officers had professional experience of 2-4 years. However, nurses having professional experience of less than 1 year and more than 8 years were nearly equal [Table 1]. Most of the nurses (91.2%) had at least one smartphone. Among

all, nearly half of them have been using smartphones for the last 5-10 years, and 68.3% of nurses used to spend daily 1-5 hours on smartphones [Table 2].

Nomophobia

Among all nurses who participated in the study, 99.5% had nomophobia, out of which more than half (53.3%) of nurses scored between 60-99 on the nomophobia questionnaire (NMP-Q) and, therefore had a moderate level of nomophobia. [Table 3]. Among the four dimensions of nomophobia, nurses scored maximum on the dimension "not being able to communicate", with the highest mean percentage score (MPS = 39.7%) and least mean percentage score obtained on dimension losing connectedness (MPS = 29.4%).

Mindfulness and self-efficacy

The mean mindfulness score was 63.65 ± 14.97. Nurses who scored more than and equal to the mean (63.65) on the Mindfulness Attention Awareness Scale (MAAS), were considered to have a high level of mindfulness. So, a little more than half of the nurses (52.6%) had a high level of mindfulness.

Similarly, the mean self-efficacy score was 31.02 ± 5.45. nurses who scored more than the mean score and thereby had a high level of self-efficacy were 53.3%.

Relationship of nomophobia with mindfulness and self-efficacy

Nomophobia was negatively correlated to both mindfulness and self-efficacy with Karl Pearson's correlation coefficient (r) of -0.289 and -0.278 respectively, showing mild negative correlation signifying that with the increase in levels of nomophobia, mindfulness and self-efficacy tend to decrease and thereby rejecting null hypotheses [Table 4].

Association of nomophobia, mindfulness, and self-efficacy with socio-demographic variables and variables related to smartphone use

The level of nomophobia was found to be significantly associated with gender (P = 0.02), area of placement (P = 0.005), and duration for which the smartphone is being used (P = 0.001). Similarly, the level of mindfulness was significantly associated with age (P = 0.03), and professional experience (P = 0.004). Moreover, level of nomophobia, mindfulness, and self-efficacy were significantly associated with the daily average time spent on a smartphone (P = 0.001).

Discussion

Abuse of technology can result in serious consequences, as mentioned in literature one of them is nomophobia.[6] The presence of nomophobia in health care providers

Table 1: Socio-demographic characteristics of nurses (*n*=420)

Socio-demographic characteristics	Frequency (f)	Percentage (%)
Age		
21-26 years	130	31.0
27-32 years	266	63.3
≥33 years	24	05.7
Gender		
Male	283	67.4
Female	137	32.6
Professional Qualification		
Diploma	55	13.1
Graduate	331	78.8
Post Graduate & Above	34	08.1
Professional experience		
≤1 year	39	09.3
2-4 years	203	48.3
5-7 years	137	32.6
≥8 years	41	09.8
Area of placement		
IPD	161	38.3
OPD	39	09.3
OT	84	20.0
ICU	46	11.0
Trauma and Emergency	90	21.4

Among 420 nurses, 63.3% were between 27-32 years of age and 67.4% were male. The majority of nurses (78.8%) were graduated. A little less than half of nurses had 2-4 years of experience. Most of the nurses were recruited from inpatient areas (38.3% of nurses), as compared to other areas

Table 2: Smartphone uses among nurses (*n*=420)

Variable	Frequency (f)	Percentage (%)
Number of smartphones owned		
1	383	91.2
≥2	37	08.8
Duration of smartphone being used		
<5 years	52	12.4
5-10 years	243	57.9
>10 years	125	29.7
Average time spent on a smartphone per day		
<1 hour	41	09.8
1-5 hours	287	68.3
>5 hours	92	21.9

The majority of nurses had one smartphone. More than half of nurses (57.9%) were using smartphones for last 5-10 years. Similarly, more than half of nurses spent daily 1-5 hours on smartphone

Table 3: Level of nomophobia among nurses (*n*=420)

Nomophobia Level	Score range	Frequency (f)	Percentage (%)	Mean±SD
Absent	20	2	0.5	68.73±24.85
Mild	21-59	145	34.5	
Moderate	60-99	224	53.3	
Severe	100-140	49	11.7	

More than half of nurses (53.3%) scored between 60-99. Hence, had moderate level of nomophobia. Similarly, the mean score also corresponds to moderate level of nomophobia. However, more than 10% of nurses had severe level of nomophobia. Whereas, there were only two nurses who scored below 20 on NMP-Q and had no nomophobia

Table 4: Correlation of nomophobia with mindfulness and self-efficacy of nurses

	Mindfulness	Self-efficacy
Nomophobia	r=-0.289*	r=-0.278*

r=Karl Pearson's correlation coefficient. Nomophobia has mild negative correlation with mindfulness and self-efficacy, depicting the reciprocal relationship of nomophobia with mindfulness and self-efficacy respectively. *Correlation is significant at 0.01 level (*P*=0.01)

can have serious repercussions on patients as it can lead to commitment of careless mistakes, neglect of important tasks, and an overall reduction in quality of care.[4] In the present study, there were only two nurses in whom nomophobia was absent. A Study conducted by Hoşgör *et al*.,[10] showed that almost 25.3% of nurses had a moderate level of nomophobia which is almost half of the result obtained in the present study. Thus, on the basis of the results obtained, it can be reaffirmed that we are facing a generation of nurses having moderate or average levels of nomophobia. The present study showed a significant association of nomophobia with gender, which is supported by the study by Erdem *et al*.,[22] suggesting that it differs by gender this may be attributed to an increased need for socialization leading to excessive smartphone use.

In today's era, smartphone serves many purposes, and being unable to fulfil these purposes cause some level of anxiety and discomfort. Here comes the role of smartphones in decreasing discomfort by facilitating the ability to connect to others and social networks. Okuyan *et al*.,[23] explained this fact, by suggesting that nomophobia increases as the daily usage time of smartphones increases. The findings of the present study are in line with this evidence, showing a significant association between the level of nomophobia with daily time spent on smartphones. Similarly, nomophobia tendencies are related to years of smartphone usage. This is consistent with the findings of the study conducted by Hoşgör *et al*.,[10] which suggested that longer years of smartphone use leads to an increase in the level of nomophobia in nursing students.

The discomfort evoked by fear of not being able to communicate is a dimension where nurses scored maximum. Study conducted on nursing students by Aguilera-Manrique *et al*.,[13] showed similar results. In this way, the main concern of nurses is the difficulty to get in contact with family and friends immediately and continuously. This elevated use can indicate the need for nurses to share emotional stress and decrease emotional fatigue associated with longer working hours, rotating shifts, and high patient demand.[12]

Nomophobia tends to have a negative impact on important constructs like mindfulness and self-efficacy. Mindfulness among nurses in the present study is considerably high as compared to findings found in the literature. A study by Regan *et al*.,[24] highlighted that higher mindfulness was significantly associated with lower problematic mobile phone use and lower boredom proneness. They also stated that a positive relationship between nomophobia and problematic mobile phone use decreased as mindfulness increased.[24]

Another construct, that is found to be affected by nomophobia is self-efficacy. It plays a major role in dealing with environmental pressures and challenges.[16] Level of self-efficacy is found to be high in more than half of nurses. However, it was negatively impacted by nomophobia. Saudagar *et al*.,[25] found that nurses with diploma degrees had higher self-efficacy than those with bachelor's degrees. Moreover, years of experience in the field of nursing were the greatest predictor of self-efficacy. On contrary, the present study found no such association.

The findings of this study had the following implications: first of all, this is the first study providing data on nomophobia among nurses and its impact on mindfulness and self-efficacy, which provides a consistent base upon which necessary interventions and policies can be planned and implemented to decrease the ill effect of technology on the well-being of nurses and quality of patient care. Awareness-raising programs can be planned and initiated as a part of continuing education for nurses, highlighting the importance and ways of judicious use of smartphones in personal and professional life.

Limitations and Recommendations

The results of this study should be regarded while keeping in mind a series of limitations. The sample was selected from a single setting using convenience sampling. Furthermore, hospital areas were selected based on approachability, both of which might affect the generalization of findings. Therefore, it is recommended that more intensive methods of selection of hospital areas must be taken into consideration. Further, some of the participants might have obscured their responses by giving responses in accordance with professional expectations and social values, leading to socially desirable bias. For answering questions related to smartphone use, no objective measurement tool was taken into consideration. Lastly, proper discussion of the topic was difficult because of the lack of research available on this topic, especially in this population. Meanwhile, it adds to the strength of the study, as this is the first study in the Indian context evaluating nomophobia and its influence on mindfulness and self-efficacy among nursing officers.

Conclusion

This study explored the level of nomophobia among nurses and its impact on their mindfulness and self-efficacy. The findings highlighted that more than half of the nurses had a moderate level of nomophobia. Moreover, nomophobia was found to be negatively correlated with the mindfulness and self-efficacy of nurses, which is clearly delineating that pervasive and non-judicious use of smartphones in the workplace can have serious consequences. One of them is the decrease in the level of mindfulness and self-efficacy of nurses. Both of which are essential for competent nursing practice and the complete well-being of nurses. When it comes to the utilization of technologically advanced devices, it becomes very important to learn healthy and judicious ways to do so, both in the professional and personal aspects. On the part of the administration, it becomes necessary to regulate this indiscriminate use of mobile phones at the workplace, especially in patient care units, and to initiate mindfulness-based interventions for negating the impact of nomophobia on important psychological constructs such as mindfulness and self-efficacy.

Ethics committee approval

The study was approved by the Institutional Ethics Committee of AIIMS, Jodhpur at meeting held on 28.04.2021 via Certificate Reference Number: AIIMS/IEC/2021/3486.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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